

**Micheelsenite****(Ca,Y)<sub>3</sub>Al(PO<sub>3</sub>OH,CO<sub>3</sub>)(CO<sub>3</sub>)(OH)<sub>6</sub>·12H<sub>2</sub>O**

**Crystal Data:** Hexagonal. *Point Group:* 6. As fibrous to acicular crystals, to 1 mm, striated along [001], terminated by {001} and hexagonal in cross-section. As rounded plates to 0.6 mm. In loosely packed spherical, fan-shaped or randomly matted aggregates.

**Physical Properties:** *Cleavage:* Good on {10 $\bar{1}$ 0} and {0001}. *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = 3.5-4 D(meas.) = 2.15(1) D(calc.) = 2.17

**Optical Properties:** Transparent to translucent. *Color:* White to colorless. *Streak:* White. *Luster:* Vitreous.

*Optical Class:* Uniaxial (-).  $\omega = 1.532(1)$   $\epsilon = 1.503(1)$

**Cell Data:** *Space Group:* P6<sub>3</sub>.  $a = 10.828(3)$   $c = 10.516(4)$   $Z = 2$

**X-ray Powder Pattern:** Poudrette quarry, Mont Saint-Hilaire, Rouville County, Quebec, Canada. 9.38 (100), 2.491 (80), 4.59 (70), 2.143 (64), 3.36 (55), 3.77 (50), 4.82 (40)

Chemistry:	(1)		(1)
CaO	16.90	SiO <sub>2</sub>	0.07
Al <sub>2</sub> O <sub>3</sub>	6.70	P <sub>2</sub> O <sub>5</sub>	7.80
Y <sub>2</sub> O <sub>3</sub>	18.07	SO <sub>3</sub>	0.53
Gd <sub>2</sub> O <sub>3</sub>	0.84	CO <sub>2</sub>	[8.38]
Dy <sub>2</sub> O <sub>3</sub>	2.65	<u>H<sub>2</sub>O</u>	<u>[43.01]</u>
Ho <sub>2</sub> O <sub>3</sub>	0.51	Total	107.34
Er <sub>2</sub> O <sub>3</sub>	1.88		

(1) Poudrette quarry, Mont Saint-Hilaire, Rouville County, Quebec, Canada; average of 3 electron microprobe analyses, CO<sub>3</sub> and H<sub>2</sub>O calculated and confirmed in the IR spectrum; corresponding to (Ca<sub>1.96</sub>Y<sub>1.06</sub>Dy<sub>0.09</sub>Er<sub>0.06</sub>Gd<sub>0.03</sub>Ho<sub>0.02</sub>) $\Sigma=3.20$ Al<sub>0.85</sub>[P<sub>0.71</sub>C<sub>0.24</sub>S<sub>0.04</sub>Si<sub>0.01</sub>] $\Sigma=1.00$ O<sub>3</sub>(OH)](CO<sub>3</sub>)(OH)<sub>6</sub>·12H<sub>2</sub>O.

**Mineral Group:** Ettringite group.

**Occurrence:** A late-stage hydrothermal product in alkaline pegmatite.

**Association:** Aegirine, albite, ancylite-(Ce), catapleiite, fluorite, microcline, monteregianite-(Y), natrolite, nenadkevichite, rhodochrosite, sérandite in pegmatites; and natrolite, titanite, calcite, pyrite in hornfels (Mont Saint-Hilaire, Canada). Aegirine, astrophyllite, analcime, calcioancylite-(Ce), catapleiite, fluorite, galena, gibbsite, leucophanite, microcline, natrolite, nafertisite, orthoclase, polyolithionite, sodalite (var. hackmanite), todorokite (Nanna pegmatite, Greenland).

**Distribution:** From the Nanna pegmatite at Narsaarsuup Qaava, South Greenland, the Narssârssuk pegmatite, Greenland and in pegmatites, hornfels, marble xenoliths, and silicate cavities at the Poudrette quarry, Mont Saint-Hilaire, Rouville County, Quebec, Canada.

**Name:** Honors Professor Emeritus of Mineralogy, Harry Ingvar Micheelsen (b. 1931) of the University of Copenhagen, Denmark. He discovered the Nanna pegmatite.

**Type Material:** Canadian Museum of Nature, Ottawa, Ontario, Canada (CMNMC 83049/50) and in the Geological Museum, University of Copenhagen, Denmark.

**References:** (1) McDonald, A.M., O.V. Petersen, R.A. Gault, O. Johnsen, G. Niedermayr, and F. Branstätter (2001) Micheelsenite, (Ca,Y)<sub>3</sub>Al(PO<sub>3</sub>OH,CO<sub>3</sub>)(CO<sub>3</sub>)(OH)<sub>6</sub>·12H<sub>2</sub>O, a new mineral from Mont Saint-Hilaire, Quebec, Canada and the Nanna pegmatite, Narsaarsuup Qaava, South Greenland. Neues Jahrb. Mineral. Mon., 337-351. (2) (2002) Amer. Mineral., 87, 2355 (abs. ref. 1).